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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/816,899

04/05/2004

Naoaki Yamaguchi

0756-7291

2636

31780

7590

10/28/2005

ERIC ROBINSON

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EXAMINER

LEE, CALVIN

ART UNIT

PAPER NUMBER

2818

DATE MAILED: 10/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/816,899

Applicant(s)

YAMAGUCHI et al.

Examiner

Lee, Calvin

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 September 2005 (Amendment).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 3-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 4/5/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## OFFICE ACTION

### *Response to Amendment*

1. The amendment of claims 3, 6, 9, 12, and 16, dated 9/27/05 is acknowledged.

### *Double Patenting*

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be owned with this application.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 3-20 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-18 of *Yamaguchi et al* (US Pat. 6,716,283) in view of US Pat 4,609,407 to *Masao et al*.

Examined claims with their conflicted features are unpatentably rejected over patent claims:

- |     |  |     |
|-----|--|-----|
| (3) | forming a semiconductor film over a substrate                          | (1) |
|     | irradiating a laser light onto the film to crystallize the film        |     |
|     | controlling an irradiation energy based on a refractive index,         |     |
|     | so that the index is within the range and measured by an ellipsometer; |     |

- 4 wherein the light selected from KrF light, ArF light, and XeCl light 2
- 5 the irradiating step performed by scanning the light with respect to substrate 3
- (6) forming a semiconductor film over a substrate (4)
- irradiating a layer light onto the film to crystallize the film
- controlling an irradiation energy based on a refractive index, wherein the light is repeatedly irradiated onto the film until the index is within a range and measured by the ellipsometer;
- 7 wherein the light selected from KrF light, ArF light, and XeCl light 5
- 8 the irradiating step performed by scanning the light with respect to substrate 6
- (9) forming a semiconductor film over a substrate (7)
- irradiating a first laser light onto the semic. film to crystallize the film
- irradiating a second laser light onto the film to further crystallize the film,
- wherein an irradiation energy of the second light is controlled,
- so that the index is within a range and measured by the ellipsometer;
- 10 wherein the light selected from KrF light, ArF light, and XeCl light 8
- 11 the irradiating step performed by scanning the light with respect to substrate 9
- (12) forming a semiconductor film over a substrate (10)
- irradiating a first laser light onto the film to crystallize the film
- measuring a first refractive index of the film
- irradiating a second laser light onto the film to further crystallize the film
- measuring a second refractive index of the film, wherein an irradiation energy of the second light is controlled based on the first refractive index;

- 13 wherein the 1<sup>st</sup> & 2<sup>nd</sup> light selected from KrF light, ArF light, and XeCl light 11
- 14 the irradiating step, using each of the 1<sup>st</sup> and 2<sup>nd</sup> lights, performed by 12
- relatively scanning the laser lights with respect to substrate
- 15 wherein the first and second refractive index measured by an ellipsometer 13
- (16) forming a first semiconductor film over a first substrate (14)
- irradiating a first laser light onto the first film to crystallize the first film
- measuring a refractive index of the first film
- forming a second semiconductor film over a second substrate
- irradiating a second laser light onto the second film to crystallize the second film,
- wherein an irradiation energy of the second light is controlled based on the first index
- so that the refractive index of the second film is within a predetermined range;
- 17 wherein the 1<sup>st</sup> & 2<sup>nd</sup> light selected from KrF light, ArF light, and XeCl light 15
- 18 the irradiating step performed by scanning the 1<sup>st</sup> light with respect to substrate 16
- 19 the irradiating step performed by scanning the 2<sup>nd</sup> light with respect to substrate 17
- 20 wherein the refractive index measured by an ellipsometer 18

The conflicted patent claims, however, are silent about forming an active layer by patterning the crystallized semiconductor film, forming a gate insulating film over the active layer, and forming a gate electrode over the gate insulating film. Nevertheless such thin-film transistor formed on the crystallized active layer is known in the semiconductor processing art as evidenced by *Masao et al* disclosing a gate insulating film 46 sandwiched between a gate electrode 47 and an active layer 45 [Fig. 6a], wherein the active layer has been formed by patterning a crystallized semiconductor layer 23 [Fig. 4b and cols. 7-8].

It would have been obvious to one having skills in the art to have modified the process of *Yamaguchi et al* by utilizing both gate insulating layer and gate electrode formed over the active layer for the purpose of manufacturing a thin-film transistor by a process including laser light illumination (i.e., having a crystallized silicon film as its active layer).

***Response to Arguments***

4. Applicant's argument that "Imahashi does not teach the relationship between a refractive index and flatness and between a refractive index and crystallinity" are persuasive. However, pending claims 3-20 have been rejected under obviousness-type double patenting in view of *Masao et al* (US 4,609,407), as clearly stated above.

***Contact Information***

5. Any inquiry concerning this communication from the Examiner should be directed to *Calvin Lee* at (571) 272-1896 on Mondays thru Thursdays 6:30-4:30PM. If attempts to reach the examiner by telephone are unsuccessful, Art Unit 2818's Supervisory Patent Examiner *David Nelms* can be reached at (571) 272-1787. The fax phone number for the organization (where this application is assigned to) is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system at <http://pair-direct.uspto.gov>. Should you have questions on access to the PAIR system, contact the Electronic Business Center at (866) 217-9197.



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Dated: October 20, 2005